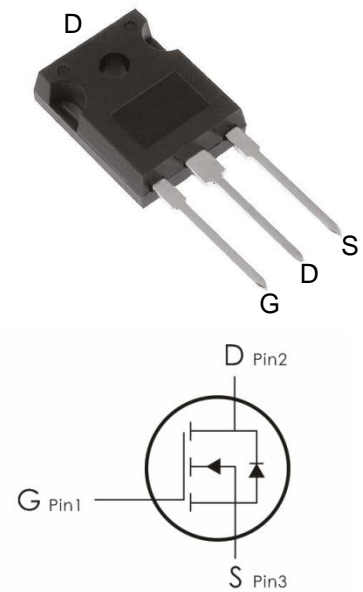


## Description:

This N-Channel MOSFET uses advanced trench technology and design to provide excellent  $R_{DS(on)}$  with low gate charge. It can be used in a wide variety of applications.

## Features:

- 1)  $V_{DS}=55V, I_D=110A, R_{DS(ON)}<0.008 \Omega @V_{GS}=10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low  $R_{DS(ON)}$ .
- 5) Excellent package for good heat dissipation.



## Absolute Maximum Ratings: ( $T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
$V_{DS}$	Drain-Source Voltage	55	V
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$I_D$	Continuous Drain Current- $T_C=25^\circ\text{C}$	110	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	80	
$I_{DM}$	Pulsed Drain Current <sup>1</sup>	390	A
$E_{AS}$	Single Pulse Avalanche Energy <sup>2</sup>	480	mJ
$P_D$	Power Dissipation	200	W
$T_J, T_{STG}$	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ\text{C}$

## Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta jc}$	Thermal Resistance, Junction to Case	0.75	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	

## Package Marking and Ordering Information:

Part NO.	Marking	Package
DOG064N	DOG064N	TO-247

## Electrical Characteristics: ( $T_C=25^\circ\text{C}$ unless otherwise noted)

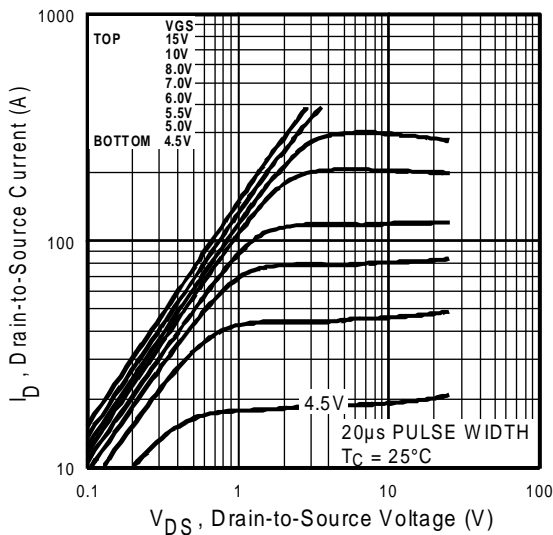
Symbol	Parameter	Conditions	Min	Typ	Max	Units
<b>Off Characteristics</b>						
$BV_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	55	---	---	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=55V$	---	---	25	$\mu\text{A}$
$I_{GSS}$	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	$\pm 100$	nA
<b>On Characteristics</b>						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	2	---	4	V
$R_{DS(ON)}$	Drain-Source On Resistance	$V_{GS}=10V, I_D=59A$	---	---	0.008	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{iss}$	Input Capacitance	$V_{DS}=25V, V_{GS}=0V, f=1\text{MHz}$	---	4000	---	pF
$C_{oss}$	Output Capacitance		---	1300	---	
$C_{rss}$	Reverse Transfer Capacitance		---	480	---	
<b>Switching Characteristics</b>						
$t_{d(on)}$	Turn-On Delay Time <sup>4</sup>	$V_{DD}=28V, I_D=59A,$ $R_G=2.5\ \Omega, R_D=0.39\ \Omega$	---	14	---	ns
$t_r$	Rise Time <sup>4</sup>		---	100	---	ns
$t_{d(off)}$	Turn-Off Delay Time <sup>4</sup>		---	43	---	ns
$t_f$	Fall Time <sup>4</sup>		---	70	---	ns
$Q_g$	Total Gate Charge <sup>4</sup>	$V_{GS}=10V, V_{DS}=44V,$ $I_D=59A$	---	---	170	nC
$Q_{gs}$	Gate-Source Charge <sup>4</sup>		---	---	32	nC
$Q_{gd}$	Gate-Drain "Miller" Charge <sup>4</sup>		---	---	74	nC
<b>Drain-Source Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage	$I_S=59A$	---	---	1.3	V
$I_S$	Continuous Source Current	$V_G=V_D=0V$	---	---	110	A

<b>I<sub>SM</sub></b>	Pulsed Source Current <sup>1</sup>	V <sub>G</sub> =V <sub>D</sub> =0V	---	---	390	A
<b>T<sub>rr</sub></b>	Reverse Recovery Time	I <sub>S</sub> = 59A; V <sub>GS</sub> =0V,	---	110	170	nS
<b>Q<sub>rr</sub></b>	Reverse Recovery Charge	di/dt = 100 A/μs	---	450	680	nc

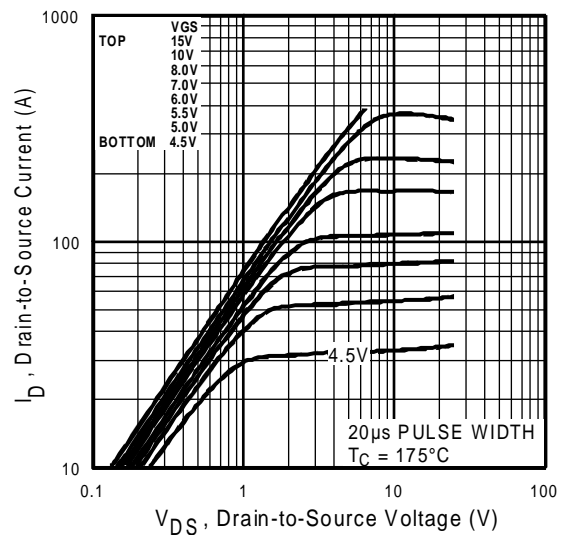
### Notes:

1. Repetitive rating; pulse width limited by max. junction temperature.
2. V<sub>DD</sub>= 25V, starting T<sub>J</sub> = 25°C, L = 190μH , R<sub>G</sub>=25Ω, I<sub>AS</sub>=59A.
3. I<sub>SD</sub>≤59A, di/dt ≤ 290A/μs, V<sub>DD</sub>≤ V(BR)<sub>DSS</sub>, T<sub>J</sub> ≤ 175°C
4. Pulse width≤300μs; duty cycle ≤ 2%.

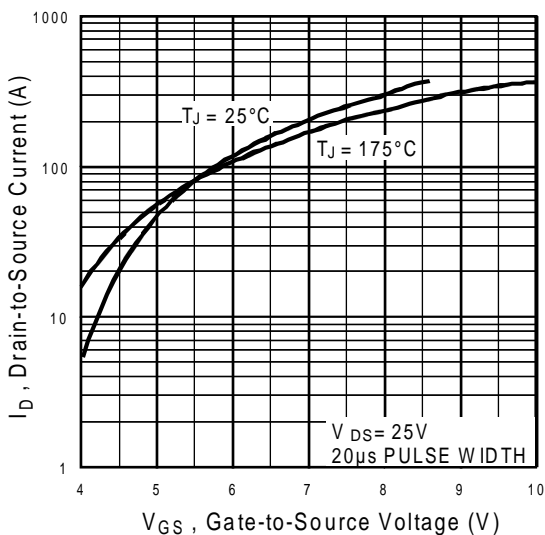
### Typical Characteristics: (T<sub>C</sub>=25°C unless otherwise noted)



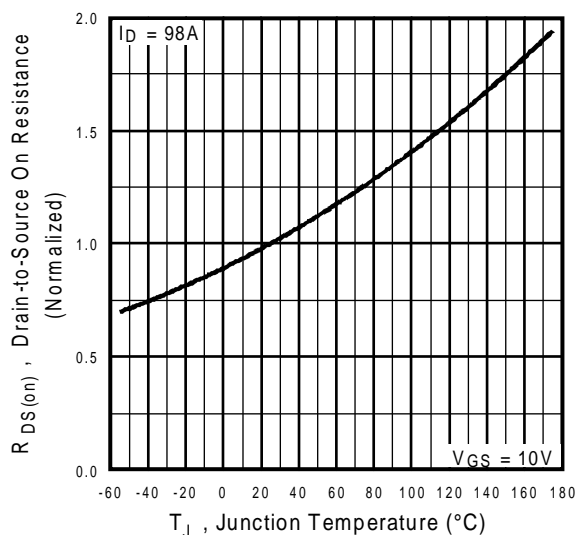
**Fig 1.** Typical Output Characteristics



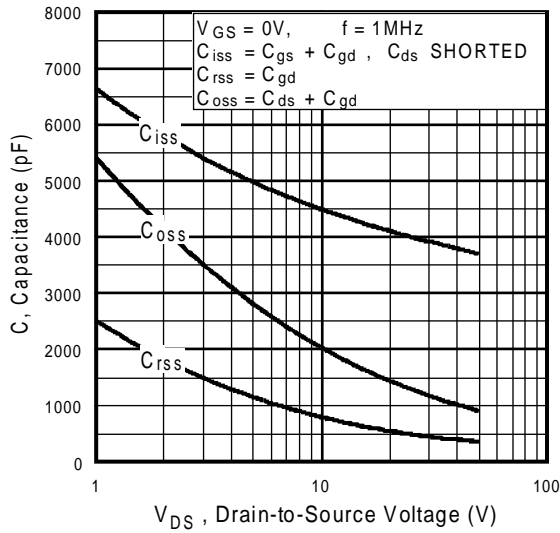
**Fig 2.** Typical Output Characteristics



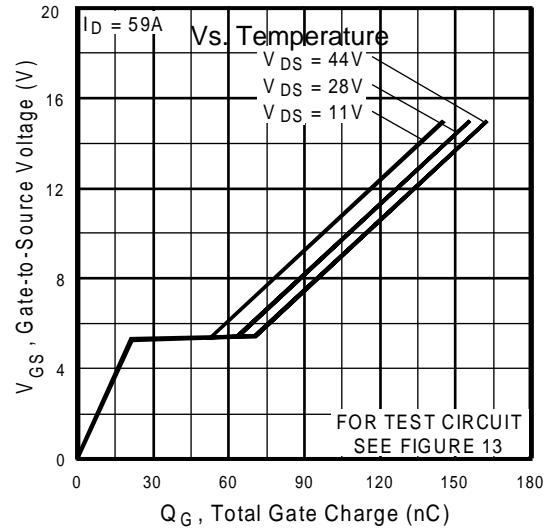
**Fig 3.** Typical Transfer Characteristics



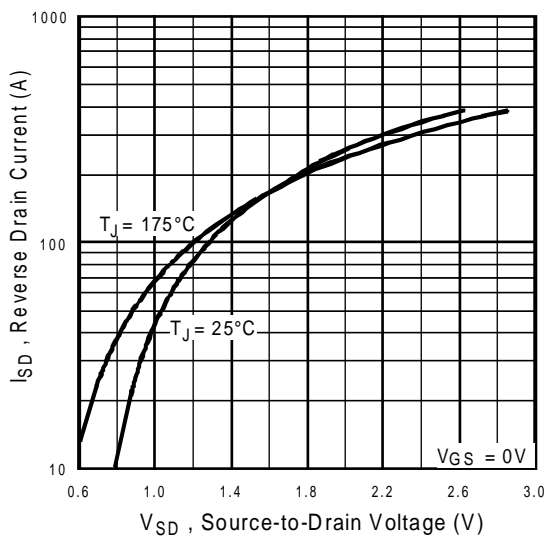
**Fig 4.** Normalized On-Resistance Vs. Temperature



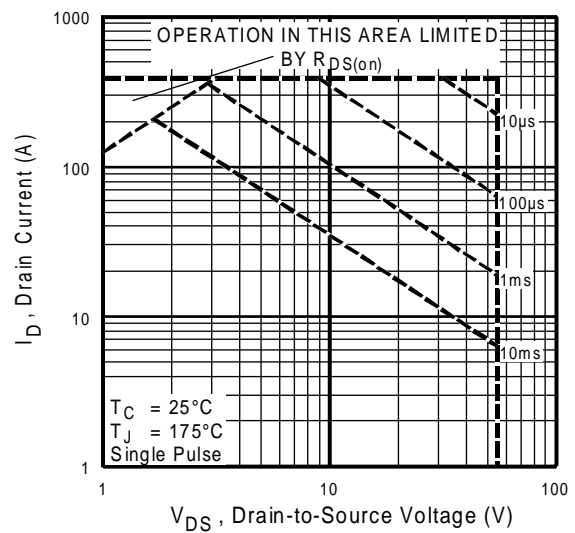
**Fig 5.** Typical Capacitance Vs. Drain-to-Source Voltage



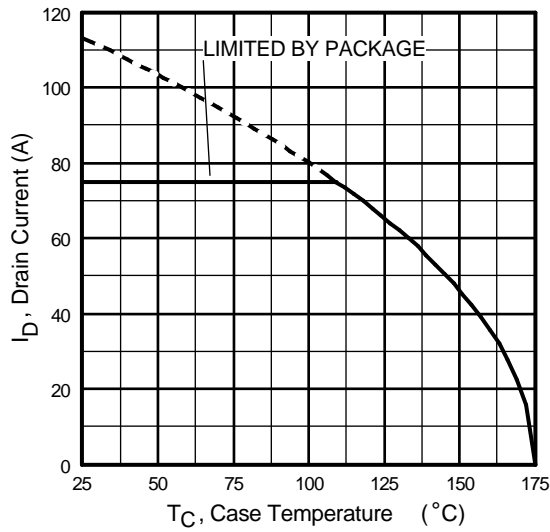
**Fig 6.** Typical Gate Charge Vs. Gate-to-Source Voltage



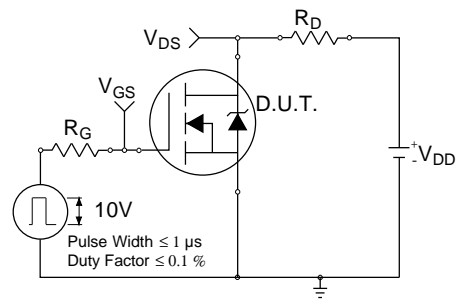
**Fig 7.** Typical Source-Drain Diode Forward Voltage



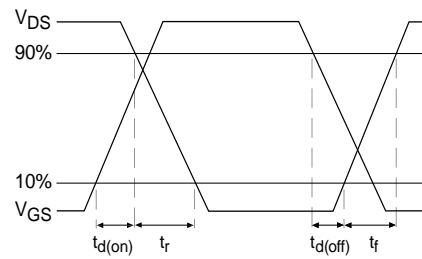
**Fig 8.** Maximum Safe Operating Area



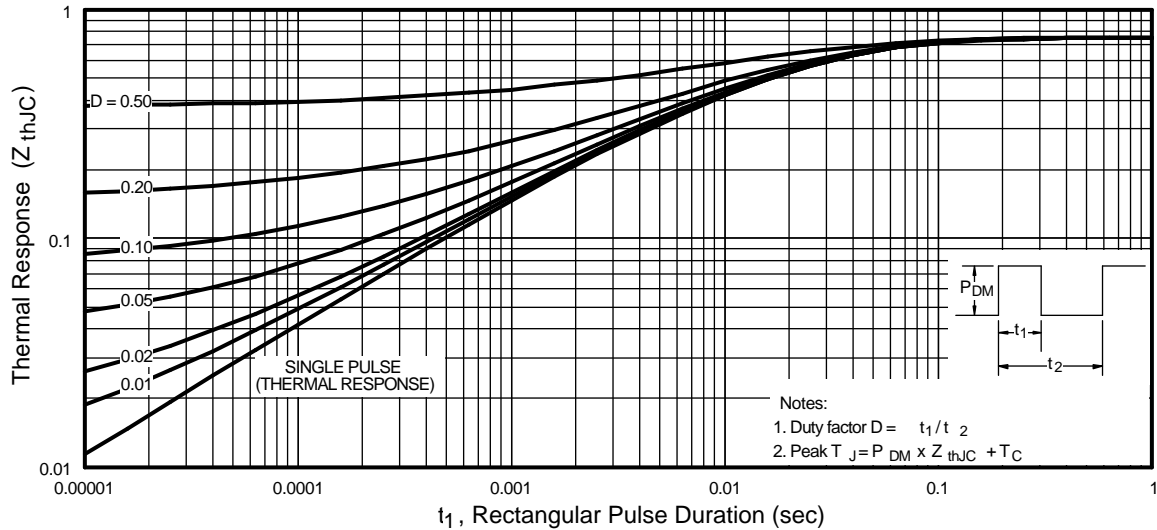
**Fig 9.** Maximum Drain Current Vs. Case Temperature



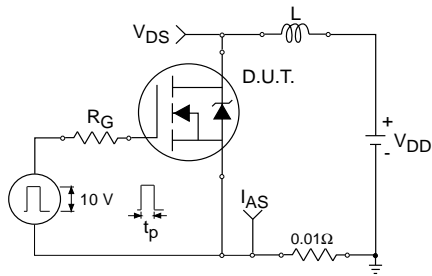
**Fig 10a.** Switching Time Test Circuit



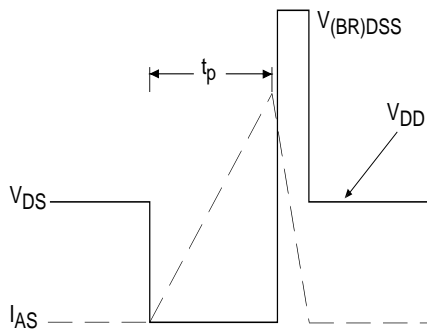
**Fig 10b.** Switching Time Waveforms



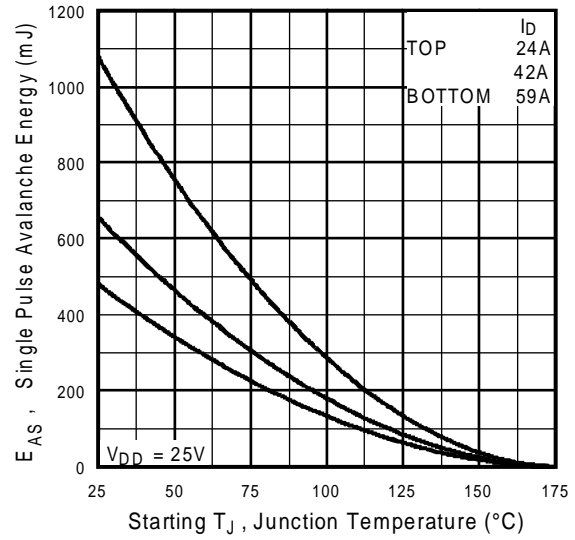
**Fig 11.** Maximum Effective Transient Thermal Impedance, Junction-to-Case



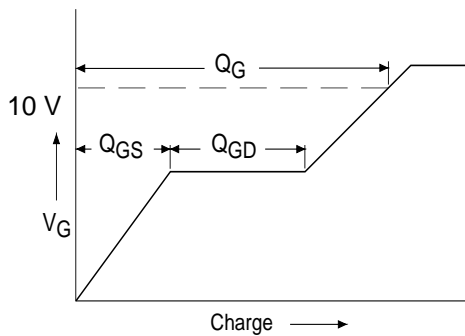
**Fig 12a.** Unclamped Inductive Test Circuit



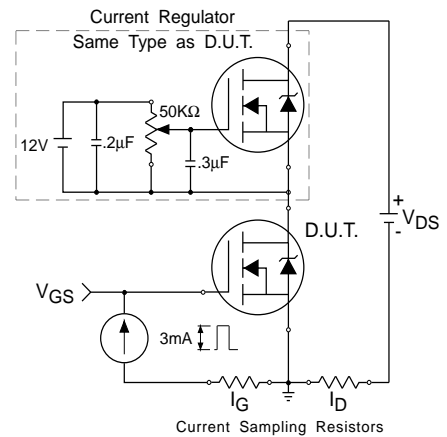
**Fig 12b.** Unclamped Inductive Waveforms



**Fig 12c.** Maximum Avalanche Energy Vs. Drain Current

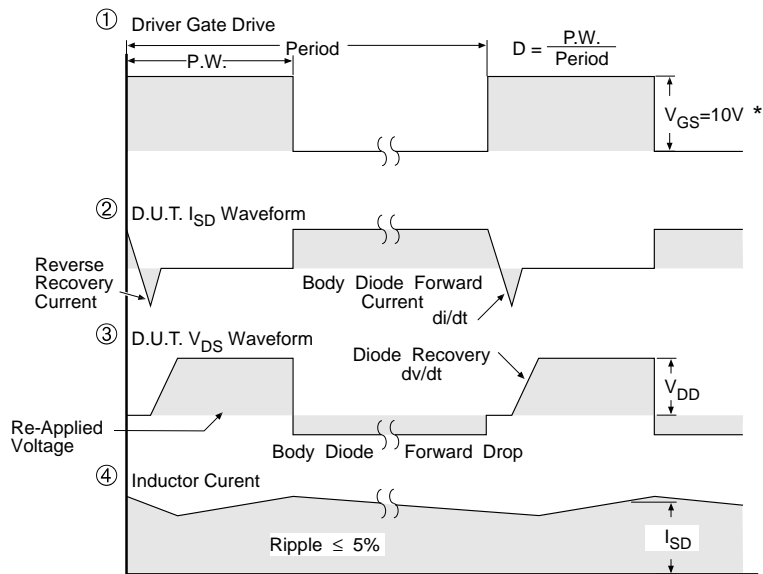
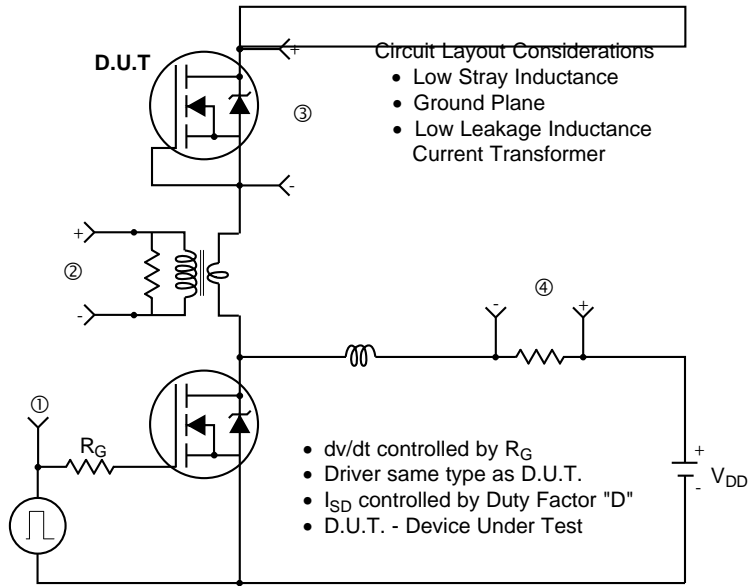


**Fig 13a.** Basic Gate Charge Waveform



**Fig 13b.** Gate Charge Test Circuit

## Peak Diode Recovery dv/dt Test Circuit



\*  $V_{GS} = 5V$  for Logic Level Devices

**Fig 14.** For N-Channel HEXFETS